

REMARKS

Applicant respectfully requests reexamination of the application.

Claims 1-59 are pending.

Claims 27-28, 30-42, 44, 45, 50-56, and 58-59 are withdrawn. Applicant reserves the right to prosecute these claims in applications derived from the pending application.

Claims 2, 3, 6, 8, 15, 16, and 17 are cancelled.

Claims 1, 4, 5, 7, 9-13, 18-20, 24-26, 29, 43, 46-49, and 57 are amended.

Support for these amendments appears in the following representative passages of the specification:

Claim Number	Supporting Material
Claim 1	Claim 1
Claim 4	Claims 1 and 4
Claim 5	Claims 1 and 5
Claim 7	Claims 1 and 7
Claim 9	Claims 1 and 9
Claim 10	Claims 1 and 10
Claim 11	Claims 1 and 11
Claim 12	Claims 1 and 12
Claim 13	Claims 1 and 13
Claim 18	Claims 1 and 18
Claim 19	Claims 1 and 19

Claim Number	Supporting Material
Claim 20	Claims 1, 18, and 20
Claim 24	Claim 24
Claim 25	Claim 25
Claim 26	Claim 26
Claim 29	Claim 29
Claim 43	Claims 1 and 43
Claim 46	Claims 1 and 46
Claim 47	Claims 1 and 47
Claim 48	Claims 1 and 48
Claim 49	Claims 1 and 49
Claim 57	Claims 1 and 57

Claims 60-71 are new. Support for these claims appears in the following representative passages of the specification:

Claim Number	Supporting Material
Claim 60	Claims 1 and 7; Spec. at Figs. 1 and 10, [0012]-[0026]
Claim 61	Claims 1 and 4; Spec. at Figs. 1 and 10, [0012]-[0026]
Claim 62	Claims 1 and 4; Spec. at Figs. 1 and 10, [0012]-[0026]
Claim 63	Claims 1 and 4; Spec. at Figs. 1 and 10, [0012]-[0026]

Claim Number	Supporting Material
Claim 64	Claims 1 and 4; Spec. at Figs. 1 and 10, [0012]-[0026]
Claim 65	Claims 1 and 4; Spec. at Figs. 1 and 10, [0012]-[0026]
Claim 66	Claims 1 and 18; Spec. at [0056]
Claim 67	Claims 1 and 19; Spec. at [0056]
Claim 68	Claims 1 and 20; Spec. at [0056]
Claim 69	Claims 1 and 21; Spec. at [0056]
Claim 70	Claims 1 and 22; Spec. at [0056]
Claim 71	Claims 1 and 23; Spec. at [0056]

The Office argues that “the only special technique” of the claimed invention “are the actual transformed mycobacteria.” (Office Action at ¶ 1.) Applicant respectfully disagrees. Due to the unspecific nature of this statement, however, Applicant will not address it in this paper.

Claim Objections:

The Office objected to claims 12-14, 18-23, 29, 43, 46-49, and 57 under 37 C.F.R. § 1.75(c) for constituting multiple dependent claims that depend from multiple dependent claims. (Office Action at ¶ 1.) Applicant has amended the disputed claims to eliminate the multiple dependency; they now all depend from single claims. Thus, these objections may be withdrawn.

The Office objected to the specification for various reasons. (Office Action at ¶ 3.) Applicant has amended the specification to address each one, as indicated in the specification amendments listed above. Thus, these objections may be withdrawn.

The Office objected to Figures 3A, 3B, 3C, and 4C under 37 C.F.R. § 1.83(a) for failing to clearly depict the information contained in the images. (Office Action at ¶ 4.) In particular, the Office found it impossible to differentiate between the various shadings of grey. Applicant has provided replacement drawings. Therefore, these objections may be withdrawn.

The Office objected to claim 26 for failing to contain a period after “ca”. Applicant has amended the claim to include a period immediately afterward. Thus, this objection may be withdrawn.

Claim Rejections--35 U.S.C. § 112:

The Office rejected claims 1-3 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the claimed invention. (Office Action at ¶ 7.) The Office asserts that the claim language “as shown in” is unclear.

Applicant has amended claim 1 to replace the disputed language with the phrase “designated as SEQ ID No: 1.” Claims 2 and 3 are canceled. Thus, this rejection may be withdrawn.

The Office rejected claims 4-11 and 15-17 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the claimed invention. (Office Action at ¶ 8.) The Office argues that the claim language

“which comprises” is unclear, because it fails to indicate whether the subsequent list includes only the recited genes or the whole *M. tuberculosis* bacterium.

Applicant has amended claims 4, 5, 7, and 9-11 to recite “wherein the integrated DNA comprises” Claims 6, 8, and 15-17 are cancelled. Thus, this rejection may be withdrawn.

The Office rejected claim 24 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the claimed invention. (Office Action at ¶ 9.) In particular, the Office argues that it is unclear whether the claim recites a single *E. coli* strain that contains two cosmids or two strains that each contain a single cosmid.

Applicant has amended claim 24 to recite “strains, which have integrated a cosmid herein referred to as either RD1-2F9 and or RD1-AP34, which are contained in the *E. coli* strains deposited at the CNCM under the accession number I-2831 and I-2832 respectively.” The claim is now clear on its face. Thus, this rejection may be withdrawn.

The Office rejected claim 25 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the claimed invention. (Office Action at ¶ 10.) The Office asserts that the claim language “which corresponds to” is unclear. Applicant has amended the claim to recite “said cosmid corresponding to,” thus this rejection may be withdrawn.

The Office rejected claim 26 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the claimed invention.

(Office Action at ¶ 11.) The Office asserts that the claim language “covers” is unclear. Applicant has amended the claim to recite “said cosmid corresponding to” instead of “covers.” Thus, this rejection may be withdrawn.

The Office rejected claims 44 and 45 under 35 U.S.C. § 112, second paragraph, as indefinite for depending from non-elected claims. Claims 44 and 45 are withdrawn. Therefore, this rejection is moot.

Claim Rejections--35 U.S.C. § 102:

The Office rejected claims 1-11, 15-17, 44, and 45 under 35 U.S.C. § 102(b) as anticipated by Mahairas, *et al.*, *Molecular Analysis of Genetic Difference Between Mycobacterium bovis BCG and Virulent M. bovis*, 178(5) J. Bacteriology 1274 (1996) (“Mahairas *et al.*”). In particular, the Office argues that the cited reference teaches transformed *M. bovis* BCG, “which comprise all or part of the RD1 region of *M. tuberculosis*, which encompasses the instant SEQ ID No: 1.” (Office Action at ¶ 15.) Applicant respectfully disagrees.

Anticipation under 35 U.S.C. § 102(b) requires all of the limitations of a claimed invention to be contained within a single reference directly or inherently. See M.P.E.P. § 2131; *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). “[A] prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharmaceuticals Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citing *Continental Can Co. v. Monsanto Co.*, 948 F.2d

1264, 1268 (Fed. Cir. 1991)). Mahairas, *et al.* cannot anticipate the claimed invention, because it fails this requirement.

Mahairas *et al.* discloses a 9.5 Kb DNA fragment (RD1), which is absent from all BCG substrains but conserved in all virulent laboratory and clinical strains of *M. bovis* and *M. tuberculosis* that they tested. As revealed in the specification, RD1 does not contain all of the limitations of the claimed invention either directly or inherently. See, e.g., spec. at [0010] (stating that RD1 covers all or part of a cluster of six genes in the avirulent strains *M. bovis*, BCG, and *M. microti*); Fig. 1A (providing a graphical illustration of this information); Fig. 10 (depicting the RD1 deletion site in comparison to the neighboring genes); and spec. at [0101] (containing the legend to Figure 10). The cited figures and paragraphs reveal that the RD1 deletion site differs between organisms and that the RD1 fragment of Mahairas *et al.* covers only a fraction of the genes recited in the claimed invention. Included in RD1 are all or part of the following genes: Rv3871 (SEQ ID No 14), Rv3872 (SEQ ID No 15, mycobacterial PE), Rv3873 (SEQ ID No 16, PPE), Rv3874 (SEQ ID No 17, CFP-10), Rv3875 (SEQ ID No 18, ESAT-6), and Rv3876 (SEQ ID No 19).

Although the claimed invention may include all or part of genes encompassed by RD-1, it also contains all or part of sequences situated outside of RD1, and as such, cannot be anticipated by Mahairas, *et al.* Claim 1, for instance, recites a strain of *M. bovis* BCG or *M. microti*, wherein the strain has integrated the DNA fragment consisting essentially of RD1-2F9. As noted in the specification, this sequence includes both RD1 and sequences that lie beyond its boundaries (see, e.g., Figs. 1A and 10).

Claim 4, meanwhile, recites a strain of *M. bovis* BCG or *M. microti* according to claim 1, wherein said strain has integrated a portion of DNA originating from *Mycobacterium tuberculosis* or any virulent member of the *Mycobacterium tuberculosis* complex (*M. africanum*, *M. bovis*, *M. canettii*), wherein the integrated DNA comprises at least seven or more genes or fragments thereof selected from a subset of genes contained in the RD1-2F9 deletion fragment. While the term “seven or more” genes is not literally found in the specification, Applicant submits that the recitation “at least one, two, three or more genes” originally found in claim 4 is an adequate written description of each member of the relatively small genus of the 25 specifically identified genes. The identification of the 25 genes and the recitation of at least “one, two, three or more of these genes clearly puts the person of ordinary skill in the art in possession of “seven or more” of these genes. RD-1 contains only six genes, and the invention recited in this claim, therefore, is not disclosed either directly or inherently by Mahairas *et al.*

Claim 5 also depends from claim 1, but includes at least one gene or fragment thereof selected from the group consisting of Rv3871 (SEQ ID No 14), Rv3872 (SEQ ID No 15, mycobacterial PE), Rv3873 (SEQ ID No 16, PPE), Rv3874 (SEQ ID No 17, CFP-10), Rv3875 (SEQ ID No 18, ESAT-6), Rv3876 (SEQ ID No 19), and Rv3877 (SEQ ID No 20). Claim 7 recites a different subset of seven genes selected from RD1-2F9 than those recited in claim 4. Claims 9 -11 also depend from claim 1, but are limited to specific RD-1 genes in combination with at least Rv3877 (SEQ ID No 20), which lies beyond the RD-1 region. (See Fig. 10.) Due to the claim limitations noted

above, Mahairas *et al.* does not disclose all of the limitations of these claims either directly or inherently.

Given that Mahairas *et al.* fails to disclose the limitations of the claimed invention, either directly or inherently, it cannot anticipate claims 1, 4, 5, and 9 -11 under 35 U.S.C. § 102(b).

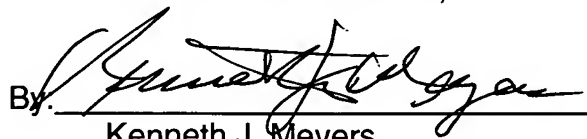
Claims 15 -17 are cancelled, and claims 44 - 45 are withdrawn from prosecution for depending from withdrawn claims. Therefore, this ground for rejection may be withdrawn.

Finally, Applicant is submitting a Deposit Declaration in fulfillment of the deposit requirements of the PTO. Office Action at 4-7.

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

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Dated: February 4, 2008

Attachments:

Replacement Figures
Deposit Declaration



Replacement Sheet

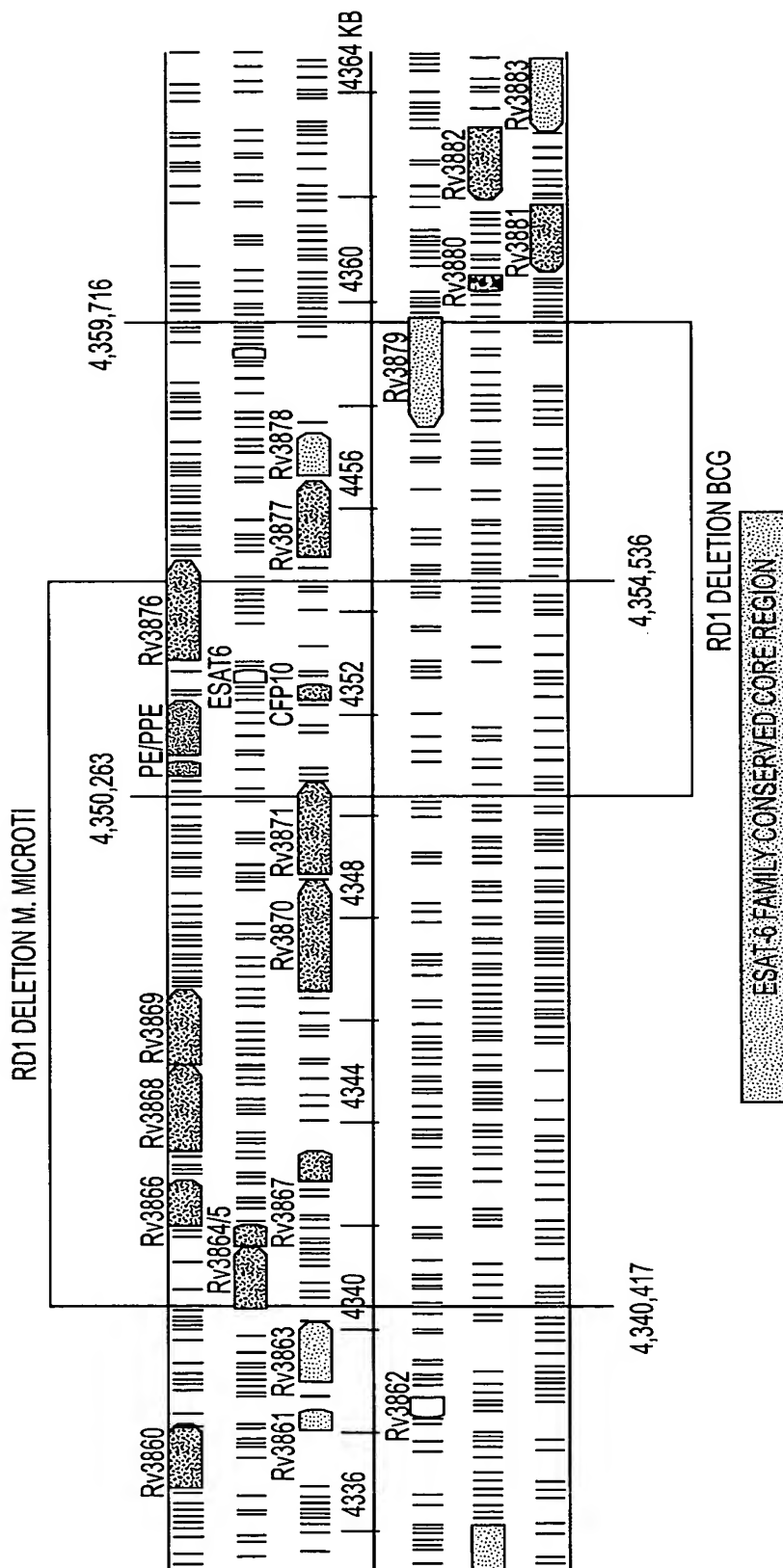


FIG. 1A



Replacement Sheet

DELETED REGION	COORDINATES (KILOBASE)	PULATIVE VIRULENCE GENES AND THEIR FUNCTION	INTEGRATING CLONES
RD3	1779-1788	PROPHAGE phiRv1 (Rv1573-1586)	RD3-I301
RD4	1696-1708	EXTRACELLULAR POLYSACCHARIDE SYNTHESIS (Rv1511-Rv1514)	RD4-I375
RD5	2626-2635	PHOSPHOLIPASE OPERON (plcA, plcB, plcC)	RD5-1B1
RD7	2208-2220	ADHESIN/INVASIN (mce3 OPERON)	RD7-1B9
RD9	2330-2332	COBALAMIN SYNTHESIS (cobL)	RD9-I493

FIG. 1B



Replacement Sheet

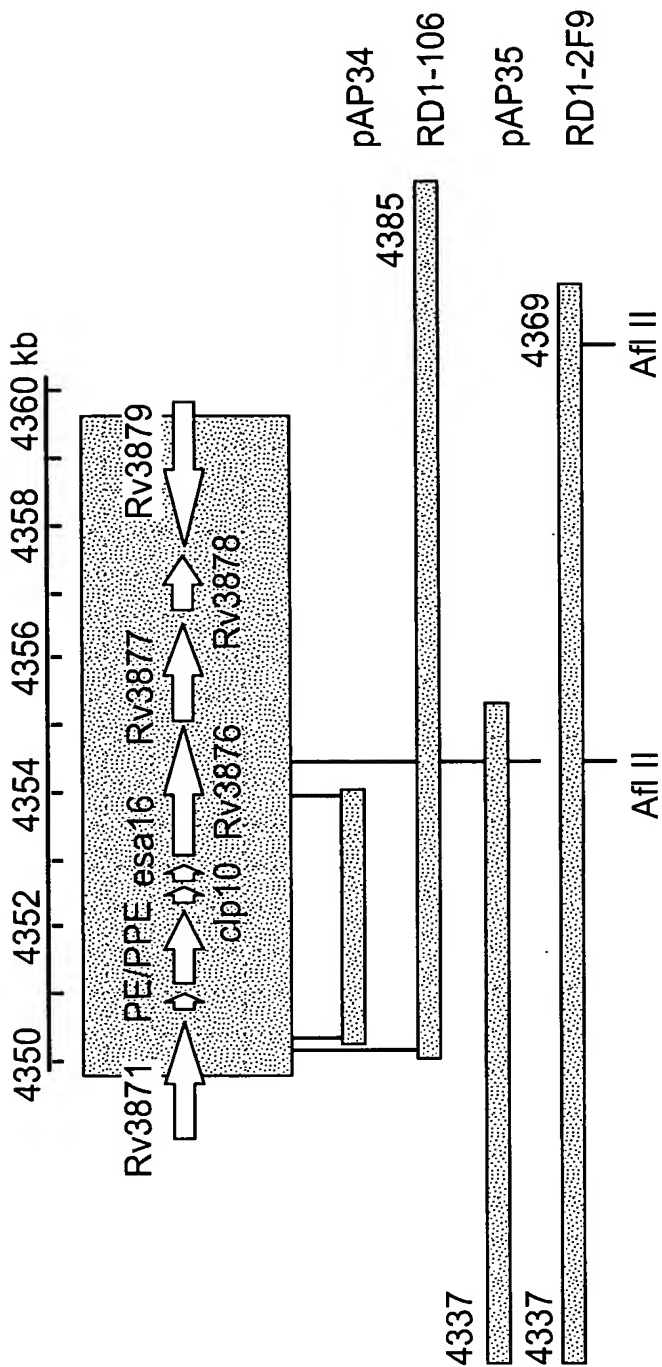


FIG. 1C

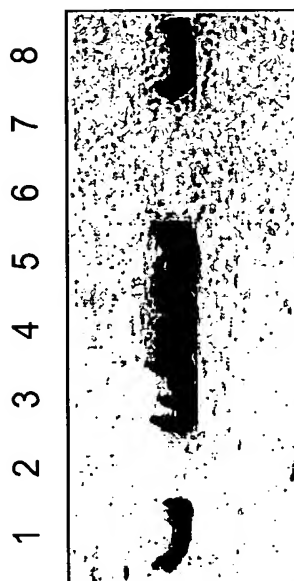


FIG. 1D